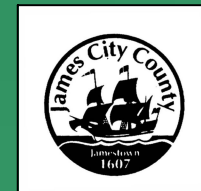




# Powhatan Creek Watershed Management Plan

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May 15, 2002



# Powhatan Creek: A Unique Resource

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- Exceptional floodplain wetlands throughout the watershed
- Home to 6 RTE plant species
- 54 species of fish found in freshwater & tidal creeks
- Eagles, ospreys, songbirds, waterfowl & heron rookery
- Shellfish beds in tidal estuary
- Ranked as having the greatest significance for biodiversity on the lower Peninsula of Virginia





# Powhatan Creek Watershed Study Team

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- James City County, VA
- James River Association
- Center for Watershed Protection,  
Ellicott City, MD
- Watershed Stakeholders
- Started July, 2000
- Current Status – Adopted in Concept by the  
Board of Supervisors on Feb. 26, 2002
- On to Yarmouth Creek Next!



# Presentation Overview

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- Powhatan Creek Watershed Statistics
- Baseline Assessment Study
- Stream & Floodplain Assessment Study
- Conservation Area Study
- Stormwater Master Plan Study
- Subwatershed Management Maps
- Management Plan Recommendations

## Powhatan Creek: Some Statistics

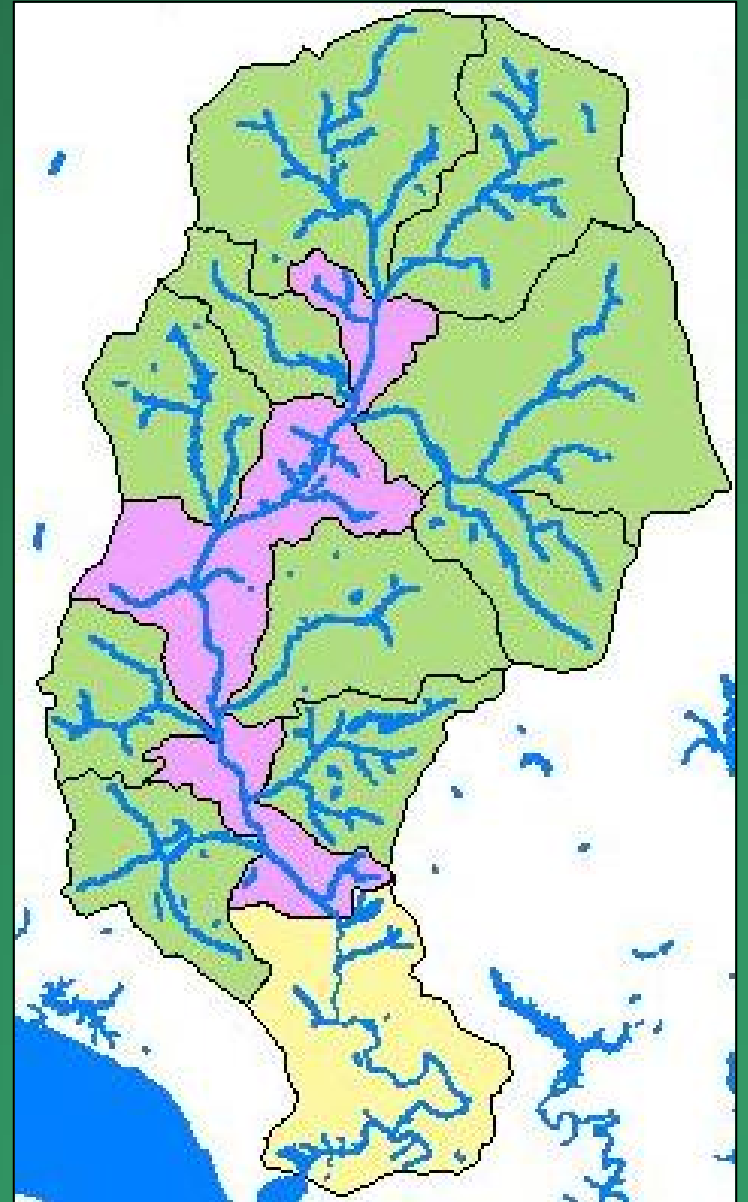
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- 22.2 square miles in size
- Drains to the James River
- 15.5% of watershed within RPA (Resource Protection Area)
- 12% of watershed within floodplains
- 30% can still be developed under current zoning
- Over 3100 homes built in watershed as of 2000
- Wastewater disposal: central sewer

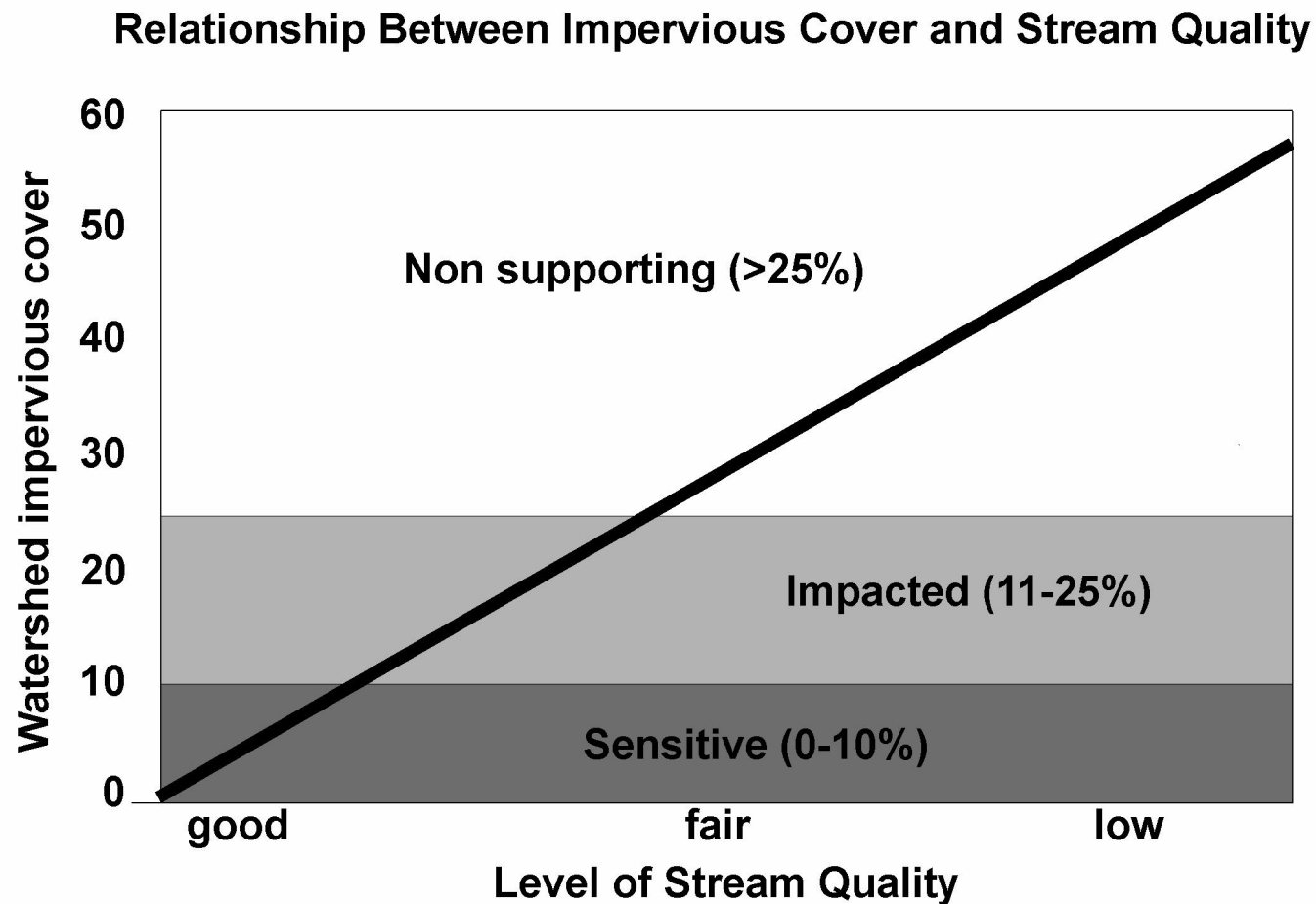
# Baseline Report

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- Impervious cover assessment – existing / future
- Assessment of conditions in:
  - 10 headwater subwatersheds
  - Freshwater Powhatan Creek
  - Tidal Powhatan Creek
- Water quality
- Fisheries assessment
- Watershed Protection Capability of James City Co



# Impervious Cover Stream Classification Model



# Baseline Report Findings:

## *At the Tipping Point*

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- Watershed degradation typically seen at **10% impervious cover**

### Powhatan Creek Watershed Impervious Cover

1970	3% (estimated)
1998	8.5%
2000	9.8 %
Future	15.5 % (buildout)

- Time, beaver, & stormwater practices may influence tipping point



# Baseline Report Findings:

## *Key Impacts*

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- Changes in hydrology in streams, wetlands, and floodplains
- Stormwater pollutants from developed areas (FC, N, P, TSS)
- Channel erosion in headwater streams
- Loss of natural habitats and RTE populations
- Invasive plant species taking over natural wetlands
- Loss of contiguous habitats
- Increased flooding

# Baseline Report Findings:

## *Management Challenges*

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- Very rapid land use change in last few years
- Clear signs of degradation in some headwater streams
- Current RPAs do not protect all vulnerable streams or conservation areas
- Contiguous forest areas are shrinking/fragmenting
- RTE populations are widely dispersed and vulnerable
- Stormwater runoff producing water quality problems

# Baseline Report Findings:

## *Watershed Tools*

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- James City County & partners DO possess most tools needed to protect watershed
  - Primary Tool: Chesapeake Bay Preservation Ordinance
  - May need additional legislative tools
- James City County & Private Sector need to play more active role in land conservation
- Aquatic Buffers may need to be extended
- Better Site Design allowed, but needs to be more widely used
- ESC and SWM recently strengthened
- Watershed mostly sewerred, few septic problems
- Potential for greater stewardship and education

# Powhatan Creek Stream Assessment Study

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56 stream reaches sampled



- 56% good/ excellent  
33% fair  
10% poor
- 3 stream reaches designated  
*SPECIAL PROTECTION*
- 9 reaches designated  
for *POTENTIAL RESTORATION*



# Powhatan Creek Conservation Area Study

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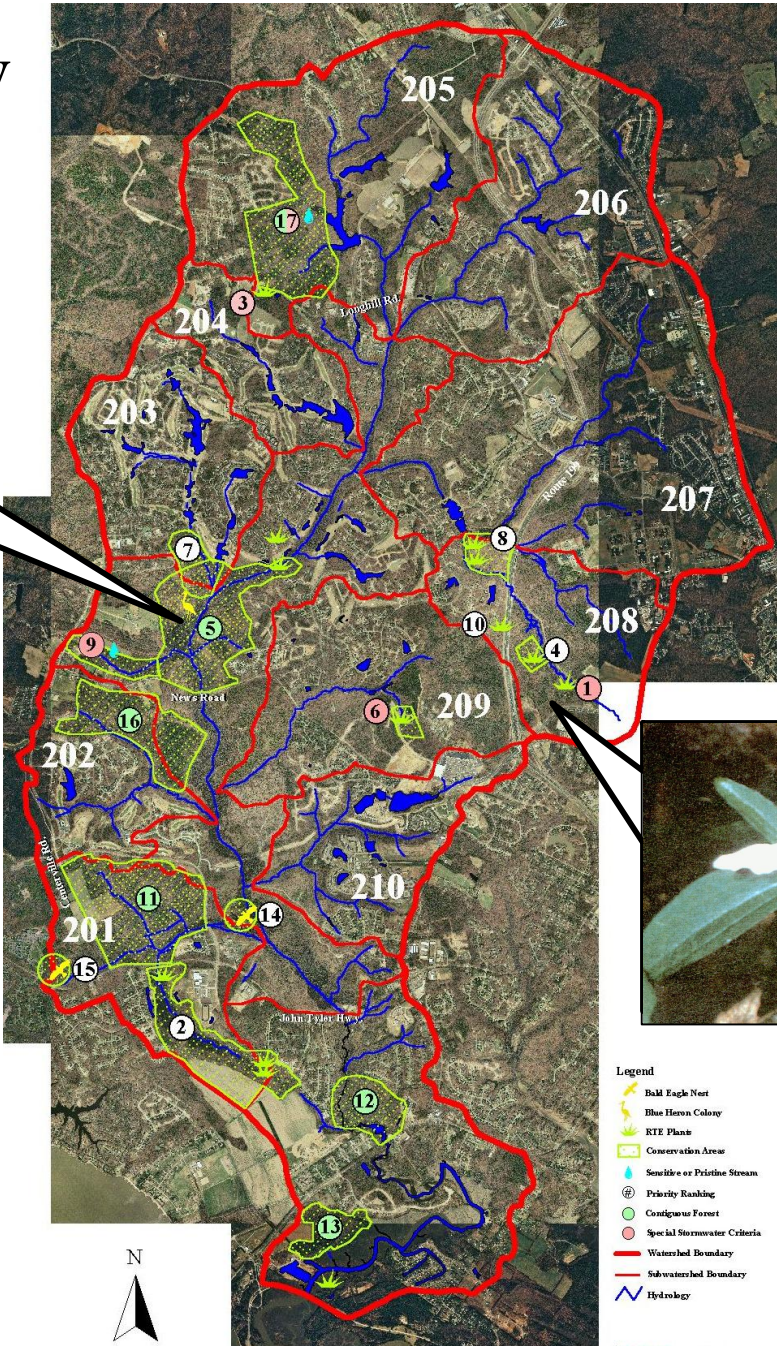
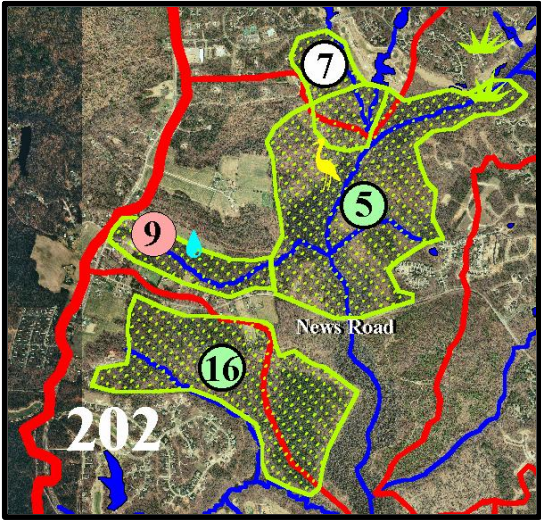
44 potential conservation areas investigated in the field



- Wetlands
- Contiguous forest tracts
- RTE habitat
- RPA extensions
- 17 priority conservation areas identified involving 1800 ac



# Powhatan Creek Priority Conservation Areas

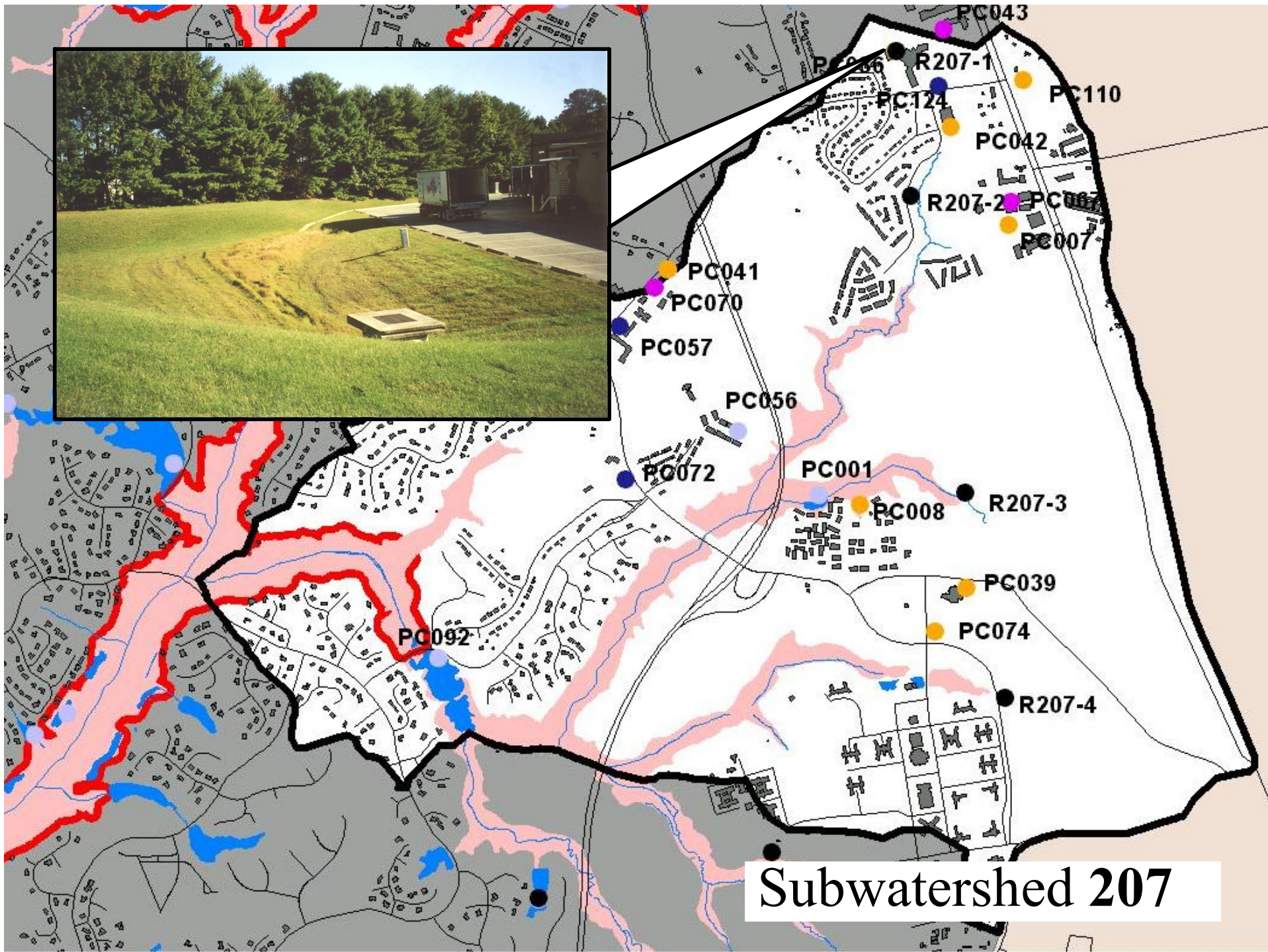




# Powhatan Creek Stormwater Master Plan

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- Evaluates stormwater treatment options in 64 smaller "catchments"
- For each catchment, a strategy for:
  - Retrofit of older practices
  - Location for regional ponds for new development
  - Special stormwater criteria
  - Implement current criteria
- Includes priority retrofit ranking and special criteria for parcel development and on-lot infill development



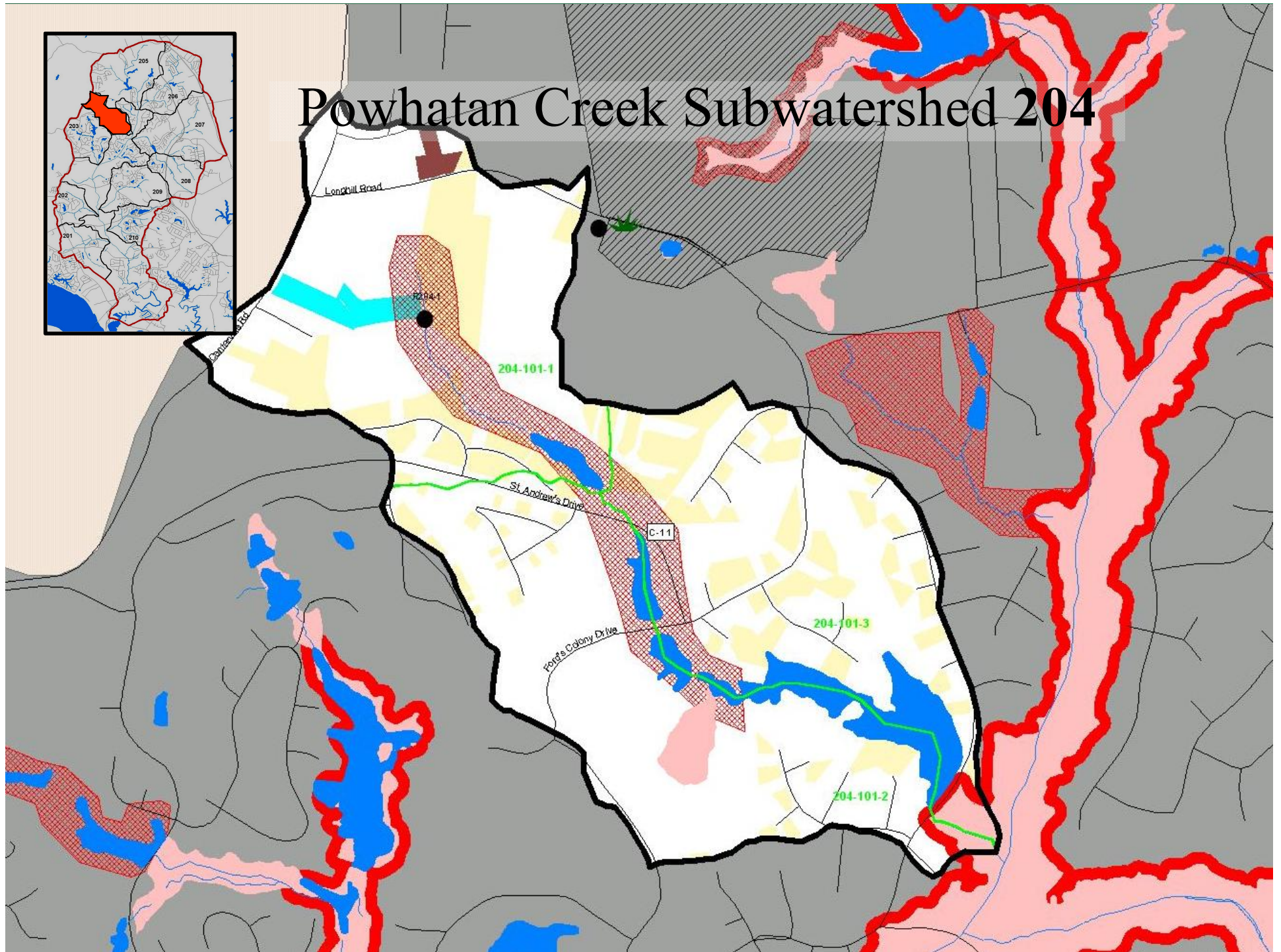
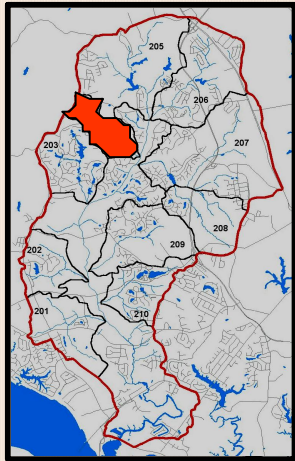
# Subwatershed Management Maps

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- 12 Maps to guide Powhatan Creek management in the future
- Reviewed with County and Stakeholder input
- Maps show location of:
  - Existing development
  - Proposed development
  - Priority conservation areas
  - RTE species
  - RPA buffers and proposed extensions
  - Stream protection and rehab. areas
  - Priority stormwater retrofit sites
  - Recommended regional facilities
  - Special stormwater zone



# Powhatan Creek Subwatershed 204





# The Eight Tools of Watershed Protection

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- ★ Land Use Planning
- ✴ Land Conservation
- ✴ Aquatic Buffers
- ✴ Better Site Design
- ⊞ Erosion and Sediment Control
- ⊕ Stormwater Management Practices
- ✧ Non-Stormwater Discharges
- ◻ Watershed Stewardship

## Land Use Planning

- Use Maps to review future development projects and evaluate rezoning requests
- Limit impervious cover in sensitive watersheds
- Cluster down – ability to reduce lot sizes in low density zoning areas to create additional open space

## Land Conservation

- Purchase Conservation Easements in Conservation Areas and along portions of mainstem buffers
- Open Space Trading or use Fee-in-lieu to acquire conservation areas and mainstem buffers
- Acquisition of Priority Conservation Areas

## Aquatic Buffers

- Extend RPA boundaries based on perennial stream determination made during study
- Increase width of buffer along portions of mainstem of Powhatan Creek
- RPA Signage with new development
- Program to assist landowners in buffer creation / enhancement

## Better Site Design

- James City County allows most Better Site Design tools (COW score of 75)
  - James City identified biggest weaknesses as being parking requirements, streets, and setbacks/frontages
- Remove impediments to use of BSD such as special use permit
- Streamline review process for BSD
- Hold Workshop with developers and planners on BSD



## Erosion and Sediment Control (ESC)

- Continue to aggressively enforce County's ESC program
- Erosion impacts from logging operations

# Stormwater Management Plan

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- Special Stormwater Criteria for sensitive watersheds
- Retrofit older stormwater ponds for improved water quality and channel protection
- Emphasize long-term maintenance of stormwater facilities
- Construct regional stormwater management facilities

## Non-Stormwater Discharges

- Most of the watershed is sewerred (lots of sewer pipes in stream valley and crossing streams)
- Active program to address the few isolated sewer overflows

## Watershed Stewardship

- Support advocacy for the Watershed (Friends of the Powhatan)
- Install Powhatan Creek Watershed Signs that link to 2007 Celebration
- Educate public on BMP maintenance, lawn care, disposal of chemicals, pollution prevention
- Golf Course turf management task force

# Powhatan Creek Watershed Management Plan

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- Developed with stakeholders, 2 Meetings
- Recommended Management Plan
- Subwatershed Management Maps
- Presented to stakeholders
- Presented to JCC Board of Supervisors
- Adopted in concept by the JCC BOS
- 24 Priorities for implementation
- Hired Watershed Planner
- Currently under staff review for action items

# Powhatan Creek Watershed Management Plan – 8 Goals

- Prevent further degradation of water quality in Powhatan Creek and maintain the outstanding quality of tidal and non-tidal mainstem wetlands.
- Maintain biological and habitat diversity and promote habitat connectivity by protecting wildlife and riparian corridors between watersheds, sub-watersheds, and the tidal and non-tidal portions of Powhatan creek.
- Develop an affordable and effective watershed management plan that can be implemented by JCC.
- Establish a transparent and stream-lined permitting process, and to provide cost-effective and incentive-based regulations or guidelines for “green” development.

# Powhatan Creek Watershed Management Plan – 8 Goals

- Improve the existing mechanisms for completing stormwater maintenance and retrofitting, and provide for adequate long-term funding.
- Link the unique history and culture of Jamestown and colonial Williamsburg with Powhatan creek watershed protection. Implement the majority of the watershed plan by the 2007 Jamestown celebration.
- Promote watershed awareness and active stewardship among residents, community associations, businesses, and seasonal visitors through educational programs, recreational opportunities, and participatory watershed activities.
- Restore the physical integrity of degraded headwater streams where possible, and protect the high quality streams from the negative morphological effects associated with increased urbanization.









Channel incision  
and enlargement in  
Subwatershed 210

High quality stream  
channel in  
Subwatershed 208





# Powhatan Creek Conservation Area Study

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- Up to 1800 acres of conservation areas to protect
- Larger buffer on mainstem Powhatan Creek
- Protect few remaining large forest tracts
- Locate RTE species  
in path of future  
development





# Developing the Rapid Watershed Plan for Powhatan Creek

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- Developed with Stakeholders
- Baseline Assessment
- Detailed Management Plan with Specific Tools
- Subwatershed Management Maps
- Adoption and Implementation

# Powhatan Creek Watershed Management Plan – 21 Priorities

- Use sub-watershed maps to review future development projects, negotiate proffers, and review rezoning requests.
- Implement new RPA boundaries based on perennial streams and other environmentally sensitive areas based on CBLAB.
- Open space trading or fee-in-lieu to acquire conservation areas and mainstem buffers.
- Purchase conservation easements in conservation areas and along mainstem buffers.
- Special stormwater criteria in sensitive stream areas and conservation areas.
- Hire watershed planner/restoration planner.
- Stormwater retrofits.

# Powhatan Creek Watershed Management Plan – 21 Priorities

- Long term maintenance of stormwater facilities, stormwater utility.
- Expand BMP homeowner education program to include lawn care and conversion, pet waste, car washing and other watershed behaviors.
- Better site design.
- Better site design workshop with developers and staff.
- Golf course management task force to discuss potential improvements in turf management/nutrients, pesticides, buffer protection, stream crossings and invasive species.
- Restore three stream sections over 5 years.
- Monitor the effects of the special stormwater criteria, JCC's regular stormwater criteria and the stream restoration efforts of stream channels.



# Powhatan Creek Watershed Management Plan – 21 Priorities

- Plan for and monitor the protection of the RTE species in new town, monitoring to continue through the development process.
- RPA signage with new development.
- Powhatan creek watershed signs which link the Jamestown 2007 celebration.
- Program for assisting landowners in buffer creation.
- Acquisition of priority conservation and other sensitive areas.
- Re-compute impervious cover for all sub-watersheds in 5 years.
- Future regional stormwater facilities, 2-3 over 5 years.